

## دراسات أولية عن التغيرات الموسمية وكتافة البراغيث التي تصيب القطن في البيئات الريفية والحضرية في مصر

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### الملخص

أمكن في هذا البحث فحص مجموعة من القطن الضالة على مدار عام كامل من بعض الأحياء الشمسية بالقاهرة وقرى محافظة الجيزة واتضح انها مصابة بالبراغيث بنسب عالية مما يشير الى أهميتها الكبيرة كحامل وموزع لتلك الحشرة التي قد تلعب دورا خطيرا في نقل مرض الطاعون والتيفوس المتوطن وبعض أنواع الديدان الشريطية . واتضح من هذه الدراسة أن ذكور القطن أعلى إصابة من الإناث كما أن كثافة البراغيث ترتبط بحجم القطة اذ تتناسب معها تناسباً طردياً واستثناء من تلك القاعدة فإن القطن صغيرة السن كانت إصابتها عالية ربما لقلة نشاطها وبقائها لفترة أطول بالمساكن بعيدا عن أثر التغيرات الجوية .

وبينت تلك الدراسة أيضا أن إناث البراغيث أعلى كثافة على إناث القطن والعكس صحيح بالنسبة للذكور مما يستدعي مزيداً من البحث لتقصي أسباب تلك الظاهرة وأهميتها .

كما أظهرت تلك الدراسة أن الجو من العوامل الهامة التي تتحكم في انتشار البراغيث فكثافتها تزداد خلال المواسم الباردة والامتدلة عنها في فصل الصيف والخريف وربما يرجع ذلك الى احتمالها بالبراغيث بفراء القطن الدافئة خلال الشتاء مما ينتج عنه زيادة ظاهرية في كثافتها .

وقد تبين أن النوع السائد على القطن هو برغوث القطن ذو المشطين بينما تبين أن برغوث الإنسان وبرغوث الفأر الشرقي يتطفلان على القطن بنسب ضئيلة .

وأوضحت هذه الدراسة أن القطن التي تعيش في أحياء القاهرة الشعبية أعلى إصابة من القطن الضالة بالقرى مشيرة الى أن البيئة في الأحياء الشعبية أكثر ملاءمة لتكاثر البراغيث بدرجة أكبر .

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## PRELIMINARY STUDIES ON THE POPULATION DENSITY AND SEASONAL VARIATION OF FLEAS INFESTING STRAY CATS, UNDER URBAN AND RURAL CONDITIONS, IN EGYPT

(with 4 tables)

By

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### SUMMARY

Stray cats collected from certain slum areas of Cairo and Giza villages were examined for flea infestation throughout a whole year.

Results indicate that stray cats are highly infested with fleas. This should draw our attention to the role of cats as carriers and disseminators of fleas which are incriminated in the transmission of Plague, Murine typhus and the tape worm *Dipylidium caninum*.

As for the sex and size of the host, male cats showed higher infestation than the females. A direct relationship was observed between the flea index and surface area of the host as indicated by its total length. Nevertheless, the youngest cat group showed higher infestation in spite of their young sizes. This is probably due to their limited activity and longer stay in houses away from the outdoor adverse conditions rendering them more vulnerable to infestation with fleas.

Study of the sex ratio of fleas points out to the predominance of female fleas over males. Besides, a direct relationship was observed between the sex of the flea and the host, a phenomenon which needs further work to investigate its significance and cause.

Concerning the effect of the climate on the prevalence of fleas on their hosts, the cats, it seems that temperate climate is more favourable rather than the hot macro-climatic conditions. Fleas seem to secure shelter in the fur of the host especially during the cold months of the year resulting in higher densities.

Identification of fleas showed that *Ctenocephalides felis* is the most dominant species, whereas *P. irritans* and *X. cheopis* constitute a minor proportion.

Cats living in the slum areas of Cairo showed more infestation with fleas than cats of rural areas. This is probably due to the more favourable breeding conditions in the former areas.

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## INTRODUCTION

Fleas are known to transmit some pathogens of serious diseases to man and his domestic animals. Most fleas are not strictly host specific, they infest their host temporarily then pass to another host of the same or even of a different species. This large scale migration of fleas increases their vector potential among a wide range of hosts.

Among pet animals, cats probably stand first in Egypt as they are more intimately associated with man and more confined to houses than dogs which are not equally welcome. Nevertheless, cats are usually raised under unhygienic conditions and rarely receive proper care. This may account to the high infection rate of cats with helminths (ARAFA *et al.*, under publication) and *Toroplasma* (ARAFA *et al.*, under publication).

The present study was assigned to demonstrate the role of cats as flea carriers and disseminators in some rural and urban areas under our Egyptian environmental conditions all over the year.

## MATERIAL AND METHODS

Cats were captured alive from two ecologically different areas, urban and rural. The former was represented by certain slum areas in the metropolis of Cairo City and the latter by some villages in Giza Governorate. Both areas have more or less the same climatic conditions.

Cats were collected throughout a year covering nearly the whole seasons; a (winter & spring) from June to November and a (summer & autumn) from December to May; during the former seasons, the maximum temperature ranged from 27.5 to 35.2°C., the minimum from 15.5 to 20.1°C., and the relative humidity from 48 to 70%. During the latter seasons the maximum temperature ranged from 20.9 to 31.7°C., the minimum from 8.7 to 16.4°C. and the relative humidity from 46 to 61%.

A total of 246 cats, 142, from Cairo and 104 from Giza were examined. Cats were transferred alive to the laboratory in canvath bags. They were chloroformed, sexed and measured for the total length extending from the tip of the nose to the base of the tail with the head slightly flexed. They were combed thoroughly with a hard wash on a white sheet. Fleas were counted, preserved in 70% alcohol and labelled. Fleas were identified after being treated with caustic soda, dehydrated in ascending grades of alcohol and them cleared in clove oil.

## RESULTS AND DISCUSSION

The infestation rate and flea index in relation to the total length and sex of the host are presented in Table (1). The total infestation rate and flea index amount to 95.5% and 16.1 respectively. They are markedly greater than the corresponding figures given by SALIT (1969) probably due to different catches of cats and different techniques adopted in collection.

Males showed apparently higher rate and density of fleas than female cats (Table 1).

The infestation rate showed irregular but little fluctuations in relation to the total length of the host, however, a more obvious drop in the middle length group (31—35 cm) was observed. The flea index on the other hand showed a gradual rise with the increase of the total length of the host, probably correlated with its increased surface area. Nevertheless, the extraordinary high index on the youngest group is likely due to their limited activity and confinement to houses away from the outside adverse climatic conditions (Table 1).

Study of the sex ratio of fleas (Table 2) showed marked predominance of female fleas over males. This might be attributed, as pointed out by POLLITZER (1954), to the smaller surface area to mass in females which renders them less sensitive to climatic conditions, particularly low humidity. It was also observed that female fleas are more abundant on female cats. A similar observation was reported by ARAFA (1968) for fleas of rats in Egypt. This phenomenon merits further investigation to reveal its bearings and the underlying cause which seems to have something to do with the hormones of the host.

From Table (3) it is obvious that the infestation rate and flea index are higher during the cold and warm seasons of the year (from December to May) which conforms with the findings of SALIT (1969). This does not necessarily indicate absolute abundance of fleas during these seasons, though this is quite possible due to more suitable climatic conditions. However, it seems more probable that fleas remain confined to the host during the cold months securing better protection in the warm fur of the host and escaping the ambient unfavourable macro-climatic conditions.

From the same table it is obvious that *Ctenocephalides felis* (bouché 1935) is the main flea that infests cats. This confirms the findings of HERMS (1961) and SALIT (1969). On the contrary, *Xenopsylla cheopis* (Rothschild, 1903) and *Pulex irritans* (Linné, 1758) constitute very low proportions.

TABLE 1. Showing the infestation rate and Flea index on the Various Length Groups of Male and Female Cats in Egypt.

Length Group (cms)	Male Cats			Female Cats			Total Cats		
	No. Exam.	% Infest.	Flea Index	No. Exam.	% Infest.	Flea Index	No. Exam.	% Infest.	Flea Index
21-25	37	100	19	30	90	12.2	67	94.1	15.9
26-30	14	100	12.9	8	100	11.3	22	100	11.9
31-35	7	100	11.	9	66.7	15.8	16	81.3	13.5
36-40	6	100	12.3	13	100	18.4	19	100	16.5
41 +	54	100	22.1	68	95.6	13.8	122	97.5	17.5
Total . . .	118	100	18.8	128	92.2	13.5	246	95.5	16.1

Data arrived at in Table (4) indicate that there is no difference in the infestation rate of cats with fleas in rural and urban areas. Nevertheless, the flea index was markedly higher in Cairo area than in the villages of Giza, though both areas are virtually supervised by the same climatic conditions. This might be due to more favourable breeding soil in the slums of Cairo. The frequency distribution of fleas shows no difference in these two areas.

TABLE 2. Showing the Sex Ratio of Fleas Infesting Male and Female Cats in Egypt

Host (No.)	Male Cats (118)	Female Cats (128)	Total Cats (246)
Fleas Examined . . . . .	1339	1159	2498
Sex ratio (M : F) . . . . .	1 : 3.5	1 : 4.2	1 : 3.8

TABLE 3. Showing the Infestation Rate, Flea Index and Frequency Distribution of Flea Spp. on Male and Female Cats during the Hot and Warm Seasons of the year.

Season	Cats Examined	% Infest.	Flea Index	Frequency Distribution of fleas %		
				Ct. felis	P. irritans	x. cheopis
Hot (June-November) . . . . .	M* 73	100	15.5	99.1	0.6	0.30
	F 70	90.9	10.5	98.8	0.8	0.40
	T 143	95.1	13.1	98.9	0.7	0.40
Warm (December-May) . . . . .	M 45	100	24.3	98.6	1.2	0.2
	F 58	94.9	17.1	98.1	1.9	0
	T 103	97.1	20.2	98.4	1.5	0.1
Total . . . . .	M 118	100	18.8	98.9	0.9	0.2
	F 128	92.2	13.5	98.4	1.4	0.2
	T 246	95.5	16.1	98.7	1.2	0.2

\* Male Cats.

F = Female Cats.

T. = Total Cats.

TABLE 4. Showing the Infestation Rate, Flea Index, and Frequency Distribution of Fleas Spp. on Male and Female Cats in Rural and Urban Area of Egypt.

Area	Cat Sex	Cats Examined	% Infest.	Flea Index	Fleas Examined.	Frequency Distribution %		
						<i>Ct. felis</i>	<i>P. irritans</i>	<i>X. cheopis</i>
Rural . . .	M	52	100	13.8	718	99.2	0.4	0.4
	F	52	92.3	11.9	620	98.7	0.8	0.5
	T	104	96.1	12.9	1338	98.9	0.6	0.5
Urban . . .	M	66	100	22.9	1505	98.2	1.6	0.2
	F	76	92.1	14.6	1105	98.5	1.5	0
	T	142	95.8	18.4	2510	98.7	1.2	0.1
Total . . .	M	118	100	18.8	2223	98.9	0.9	0.2
	F	128	92.2	13.5	1725	98.4	1.4	0.2
	T	246	95.5	16.9	3948	98.7	1.2	0.2

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